AMENDMENTS TO THE CLAIMS

1. (currently amended) A method for backing up a computer-readable object stored on a first logical device unit, the method comprising:

when the object is not currently mirrored to a mass storage device, creating a mirror for the object on a second logical device unit ~~on a mass storage device~~;

when the object and the mirror for the object are split, resyncing the object with the mirror for the object;

splitting the object and the mirror for the object so that the mirror becomes a backup copy of the object and so that I/O requests directed to the object are not automatically directed to the mirror;

retrieving <u>a first instance of</u> a current timestamp from the second logical device <u>unit</u> and saving it as a saved timestamp;

updating the <u>current</u> timestamp upon executing any I/O operation directed to the second logical device <u>unit</u> that alters data stored on the second logical device <u>unit</u>; and

when the object is determined to need to be restored from the mirror,

retrieving a <u>second instance of the</u> current timestamp from the second logical device <u>unit</u>;

comparing the retrieved <u>second instance of the</u> current timestamp to the saved timestamp; and

when the <u>second instance of the</u> current timestamp is equal to the saved timestamp, copying the mirror to the first logical device <u>unit</u> to replace or again create the object on the first logical device <u>unit</u>.

2. (original) The method of claim 1 further including copying the object to a second backup copy on a difficult-to-modify mass storage device after splitting the object and the mirror for the object.

3. (currently amended) The method of claim 2 further including, when the <u>second instance of the</u> current timestamp is not equal to the saved timestamp, copying the second backup copy from the difficult-to-modify mass storage device to the first logical device <u>unit</u> to replace or again create the object on the first logical device <u>unit</u>.

4. (currently amended) The method of claim 3 wherein the <u>second logical device unit</u> ~~mass storage device is~~ <u>spans</u> one or more hard disk drives and the difficult-to-modify mass storage device is a tape drive.

5. (original) The method of claim 3 wherein the first and second logical units are provided by one or more disk array controllers, wherein data stored to the first and second logical units are stored by the one or more disk array controllers on one or more hard disk drives, and wherein the one or more disk array controllers provide timestamps to requesting applications and systems and update the timestamp associated with a logical device upon executing I/O operations directed to the logical device that alters data stored on the logical device.

6. (currently amended) The method of claim 1 further including, prior to retrieving a current timestamp from the second logical device <u>unit</u> and saving it as a saved timestamp, enabling timestamping on the second logical device unit, and wherein the timestamp is updated upon executing any I/O operation directed to the second logical device <u>unit</u> that alters data stored on the second logical device <u>unit</u> only when timestamping in enabled on the second logical device unit.

7. (currently amended) A method for backing up a computer-readable object stored on a first logical device unit, the method comprising:

   when the object is not currently mirrored to a mass storage device, creating a mirror for the object on a second logical device unit ~~on a mass storage device~~;

   when the object and the mirror for the object are split, resyncing the object with the mirror for the object;

   splitting the object and the mirror for the object so that the mirror becomes a backup copy of the object and so that I/O requests directed to the object are not automatically directed to the mirror;

   retrieving a <u>first instance of a</u> current count from the second logical device <u>unit</u> and saving it as a saved count;

   incrementing the <u>current</u> count executing any I/O operation directed to the second logical device <u>unit</u> that alters data stored on the second logical device <u>unit</u>; and

   when the object is determined to need to be restored from the mirror,

retrieving a <u>second instance of the</u> current count from the second logical device <u>unit</u>;

comparing the retrieved <u>second instance of the</u> current count to the saved count; and

when the <u>second instance of the</u> current count is equal to the saved count, copying the mirror to the first logical device <u>unit</u> to replace or again create the object on the first logical device <u>unit</u>.

8. (original) The method of claim 7 further including copying the object to a second backup copy on a difficult-to-modify mass storage device after splitting the object and the mirror for the object.

9. (currently amended) The method of claim 8 further including, when the <u>second instance of the</u> current count is not equal to the saved count, copying the second backup copy from the difficult-to-modify mass storage device to the first logical device <u>unit</u> to replace or again create the object on the first logical device <u>unit</u>.

10. (currently amended) The method of claim 9 wherein the <u>second logical device unit</u> <s>mass storage device is</s> <u>spans</u> one or more hard disk drives and the difficult-to-modify mass storage device is a tape drive.

11. (currently amended) The method of claim 9 wherein the first and second logical units are provided by one or more disk array controllers, wherein data stored to the first and second logical units are stored by the one or more disk array controllers on one or more hard disk drives, and wherein the one or more disk array controllers provide counts to requesting applications and systems and increment the count associated with a logical device <u>unit</u> upon executing I/O operations directed to the logical device <u>unit</u> that alters data stored on the logical device <u>unit</u>.

12. (currently amended) The method of claim 7 further including, prior to retrieving a current count from the second logical device <u>unit</u> and saving it as a saved count, enabling counting on the second logical device unit, and wherein the count is updated upon executing any I/O operation directed to the second logical device <u>unit</u> that alters

data stored on the second logical device <u>unit</u> only when counting in enabled on the second logical device unit.

13. (previously presented) A mass storage device that provides logical device units to accessing computers, the mass storage device comprising:

a medium for storing data;

data writing and reading devices for writing data to the medium and reading data from the medium;

memory and logic processing components; and

a controller that executes within a logic processing component and controls reading and writing of data to and from the memory and to and from the medium, the controller providing, in addition to execution of I/O operations, including execution of read and write operations to and from logical device units comprising portions of the medium for storing data, mirroring of an object stored on a first logical device unit to a mirror object stored on a second logical device unit and a current state metric for each logical device unit that can be requested by an accessing computer, the controller updating the current state metric for a logical device unit whenever the controller executes an I/O operation that changes the data, stored on the medium for storing data, included in the logical device unit's data.

Claim 14 (cancelled.)

15 (original) The mass storage device of claim 14 wherein the controller further provides I/O operations directed to a logical device unit that enables maintenance of a current state metric for the logical device unit and disables maintenance of a current state metric for the logical device unit, and wherein the controller updates the current state metric only when maintenance of a current state metric for the logical device unit is enabled.

16. (original) The mass storage device of claim 13 wherein the current state metric is a timestamp.

17. (original) The mass storage device of claim 16 wherein the controller updates the timestamp by saving a current time.

18. (original) The mass storage device of claim 13 wherein the current state metric is a counter.

19. (original) The mass storage device of claim 16 wherein the controller updates the counter by incrementing the counter.

20. (currently amended) A mass storage device comprising:

        data storage media;

        logical device units that write data to the media and read data from the media;

        a memory component; and

        a controller that backs up a computer-readable object stored on a first logical device unit by

            when the object is not currently mirrored to another logical device unit, creating a mirror for the object on a second logical device unit;

            when the object and the mirror for the object are split, resyncing the object with the mirror for the object;

            splitting the object and the mirror for the object so that the mirror becomes a backup copy of the object and so that I/O requests directed to the object are not automatically directed to the mirror;

            retrieving a <u>first instance of a</u> current timestamp from the second logical device <u>unit</u> and saving it as a saved timestamp;

            updating the <u>current</u> timestamp upon executing any I/O operation directed to the second logical device <u>unit</u> that alters data stored on the second logical device <u>unit</u>; and

            when the object is determined to need to be restored from the mirror,

                retrieving a <u>second instance of the</u> current timestamp from the second logical device <u>unit</u>;

                comparing the retrieved <u>second instance of the</u> current timestamp to the saved timestamp; and

                when the <u>second instance of the</u> current timestamp is equal to the saved timestamp, copying the mirror to the first logical device <u>unit</u> to replace or again create the object on the first logical device <u>unit</u>.

21. (previously presented) The mass storage device of claim 20 wherein the controller copies the object to a second backup copy on a difficult-to-modify medium controlled by logical device unit after splitting the object and the mirror for the object.

22. (currently amended) The mass storage device of claim 21 further including, when the current timestamp is not equal to the saved timestamp, copying the second backup copy from the difficult-to-modify medium controlled by a logical device unit to the first logical device unit to replace or again create the object on the first logical device unit.

23. (previously presented) The mass storage device of claim 22 wherein the difficult-to-modify medium controlled by a logical device unit is a tape drive.

24. (currently amended) The mass storage device of claim 22 wherein the first and second logical units are provided by one or more disk array controllers, wherein data stored to the first and second logical units are stored by the one or more disk array controllers on one or more hard disk drives, and wherein the one or more disk array controllers provide timestamps to requesting applications and systems and update the timestamp associated with a logical device unit upon executing I/O operations directed to the logical device unit that alters data stored on the logical device unit.

25. (currently amended) The mass storage device of claim 20 wherein the controller, prior to retrieving a current timestamp from the second logical device unit and saving it as a saved timestamp, enabling timestamping on the second logical device unit, and wherein the timestamp is updated upon executing any I/O operation directed to the second logical device unit that alters data stored on the second logical device unit only when timestamping in enabled on the second logical device unit.

26. (currently amended) A mass storage device comprising:
    data storage media;
    logical device units that write data to the media and read data from the media;
    a memory component; and
    a controller that backs up a computer-readable object stored on a first logical device unit by:

when the object is not currently mirrored to another logical device unit, creating a mirror for the object on a second logical device unit;

when the object and the mirror for the object are split, resyncing the object with the mirror for the object;

splitting the object and the mirror for the object so that the mirror becomes a backup copy of the object and so that I/O requests directed to the object are not automatically directed to the mirror;

retrieving a first instance of a current count from the second logical device unit and saving it as a saved count;

incrementing the current count executing any I/O operation directed to the second logical device unit that alters data stored on the second logical device unit; and

when the object is determined to need to be restored from the mirror,

retrieving a second instance of the current count from the second logical device unit;

comparing the retrieved second instance of the current count to the saved count; and

when the second instance of the current count is equal to the saved count, copying the mirror to the first logical device unit to replace or again create the object on the first logical device unit.

27. (previously presented) The mass storage device of claim 26 further including copying the object to a second backup copy on a difficult-to-modify medium controlled by logical device unit after splitting the object and the mirror for the object.

28. (currently amended) The mass storage device of claim 27 further including, when the second instance of the current count is not equal to the saved count, copying the second backup copy from the difficult-to-modify medium controlled by logical device unit to the first logical device unit to replace or again create the object on the first logical device unit.

29. (previously presented) The mass storage device of claim 28 wherein the mass storage device is one or more hard disk drives and the difficult-to-modify mass medium controlled by logical device unit is a tape drive.

30. (currently amended) The mass storage device of claim 28 wherein the first and second logical units are provided by one or more disk array controllers, wherein data stored to the first and second logical units are stored by the one or more disk array controllers on one or more hard disk drives, and wherein the one or more disk array controllers provide counts to requesting applications and systems and increment the count associated with a logical device unit upon executing I/O operations directed to the logical device unit that alters data stored on the logical device unit.

31. (currently amended) The mass storage device of claim 26 wherein the controller, prior to retrieving a current count from the second logical device unit and saving it as a saved count, enabling counting on the second logical device unit, and wherein the count is updated upon executing any I/O operation directed to the second logical device unit that alters data stored on the second logical device unit only when counting in enabled on the second logical device unit.